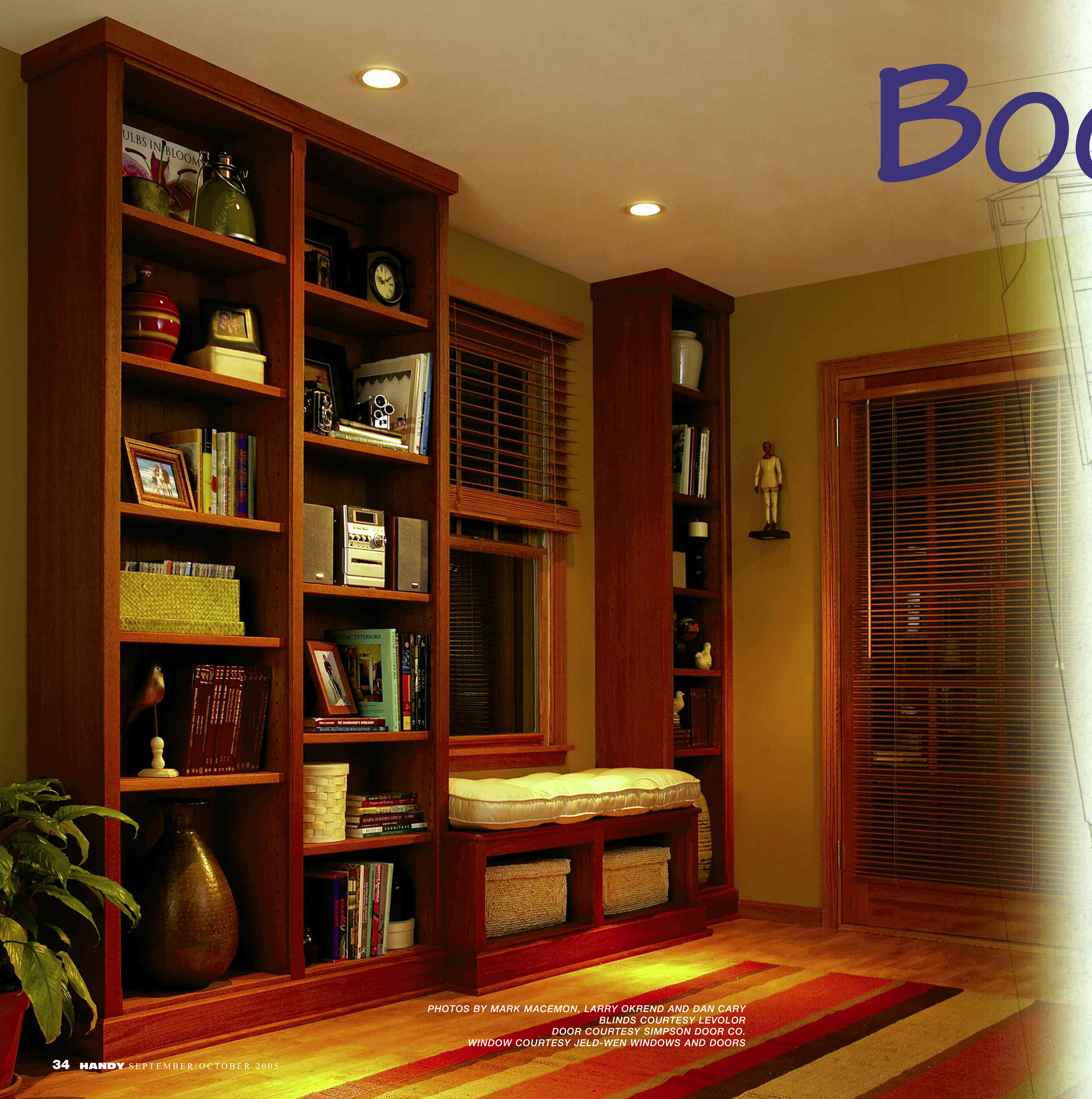

PHOTOS BY MARK MACEMON, LARRY OKREND AND DAN CARY
BLINDS COURTESY LEVOLOR
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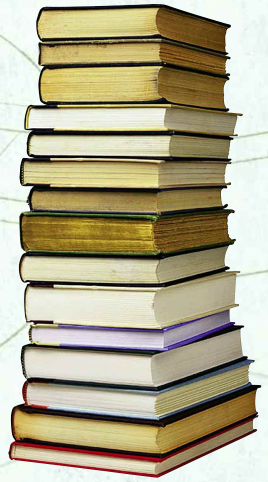
TOP-SHELF BOOKCASE

Add storage and style to a room or hallway with a built-in unit

BY DAN CARY



Whether you fill it with first-edition novels, art pottery or your favorite DVDs, a bookcase is a useful and versatile piece of furniture in any home. Freestanding and wall-mounted bookshelves offer the benefits of portability and easy installation. But by making a little extra effort you can greatly increase storage capacity and architectural interest with a built-in unit.

Built-in bookcases can be elaborate, but they are not necessarily hard to build. We designed an elegant cabinet that even a beginning woodworker can complete; the most difficult aspect might be handling the plywood and finding the space to assemble the large cabinets.

CUSTOMIZE THE DESIGN

You might think built-in bookcases are only for large rooms, but they also work well in very small rooms and even hallways. Tight spaces like these are often

BOOKCASE

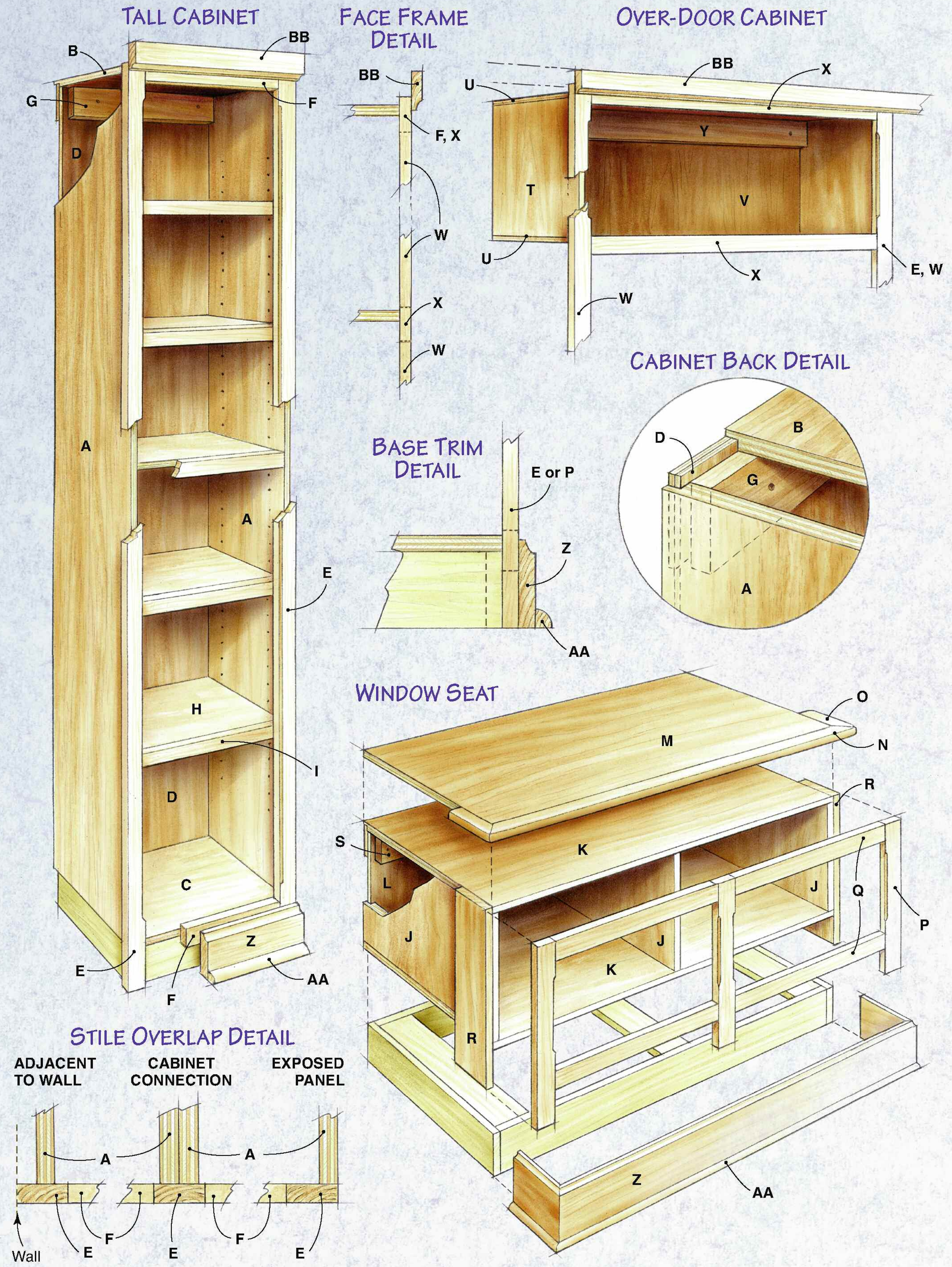
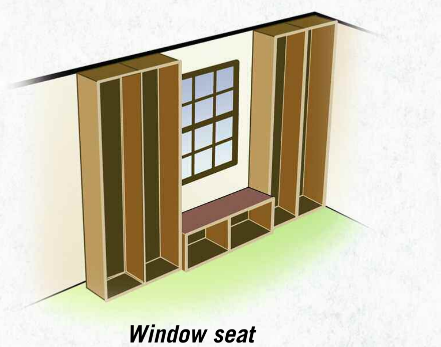
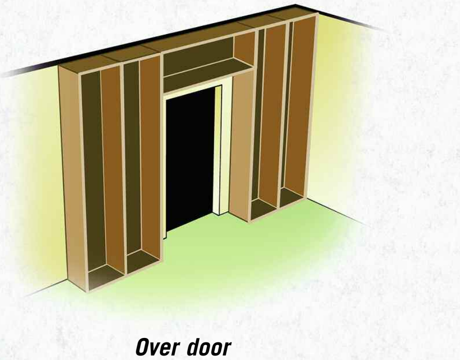


ILLUSTRATION BY TECH ART & DESIGN

CONFIGURATION OPTIONS


Window seat


Over door

Open wall with seat

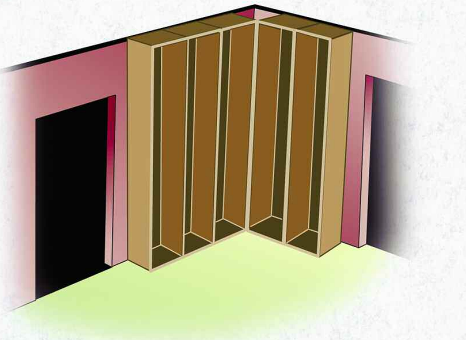

Corner unit

ILLUSTRATION BY MIKE ANDERSON

too small for furniture arrangements but offer enough space to accommodate a built-in cabinet. Bookcases are often installed on an empty wall, but you might consider building one around a door or window to make the unit seem more integrated with the room. This approach can also make the unit more functional — for example, the bookcase I built also serves as a nook and window seat. To incorporate a door opening into the unit, you can install a cabinet above the door that connects bookcases on both sides.

If you are planning to install a bookcase on an empty wall, consider breaking up the bookcase units with an opening instead of filling the entire wall with shelves. This approach can create a nook that adds dimension to the room and provides a place to hang a piece of art. Another option is to install bookcases on two adjacent walls, butting the inside bookcase corners together to create a corner unit.

Two additional design considerations are which type of shelving to use and whether you will integrate lighting into the bookcase. Plywood shelves are most common but require solid-wood edging as reinforcement to prevent them from bowing. Glass shelves should be used to support only lightweight decorative objects and should be made of tempered glass that's at least 1/4 in. thick and no wider than 30 in.

You can build integral lights into the unit or install them in the room and direct them toward the bookcase. The most common integral lights are small "pot" or "puck" lights. These lights are typically recessed in 55- to 60-mm holes that are drilled through the top of the cabinet. Install pot lights before attaching the face frame and trim. I installed recessed ceiling lights in front of the bookcase.

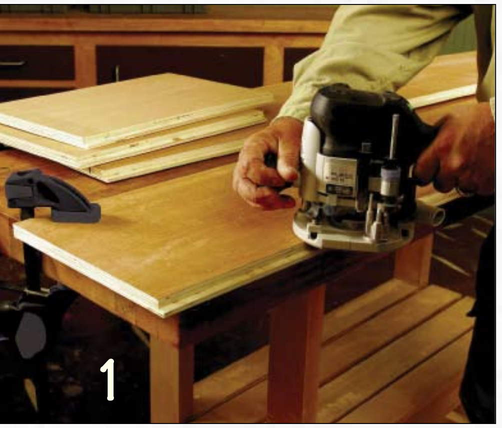
Once you have determined the space that you want the bookcase to fill, it is time to design the specific structural elements. This bookcase is simply a set of cabinet boxes with a face frame covering the seams. Determine the number and size of cabinets that will be required to fill the space, keeping in mind that no vertical cabinet should be more than 30 in. wide. For example, we combined three tall cabinets and one short cabinet to fit around a window. You might need to change the dimensions of the boxes to

MATERIALS AND CUTTING LIST

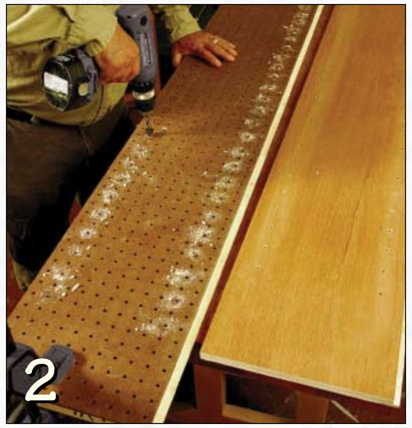
Editor's note: Dimensions in red may be modified for larger or smaller cabinets

Key	Description	Size
24-IN.-WIDE TALL CABINET		
A	Side panels	3/4 x 11-1/2 x 91 in.
B	Top panel	3/4 x 11-1/2 x 24 in.
C	Bottom panel	3/4 x 11-1/2 x 22-1/2 in.
D	Back panel	1/4 x 23-1/2 x 90-1/2 in.
E	Face frame stiles	3/4 x 2 x 94 in.
F	Face frame rails	3/4 x 2 x 20 in.
G	Wall cleat	3/4 x 2 x 22-1/2 in.
H	Shelves	3/4 x 10-1/8 x 23-3/4 in.
I	Shelf edging	3/4 x 1-1/4 x 22-3/8 in.
48-IN.-WIDE WINDOW SEAT		
J	Side and center panels	3/4 x 16 x 12 in.
K	Top and bottom panels	3/4 x 16 x 48 in.
L	Back panel	1/4 x 16 x 47-1/2 in.
M	Seat board	3/4 x 16 x 48 in.
N	Front seat board edging	3/4 x 1-1/4 x 50-1/2 in.
48-IN.-WIDE WINDOW SEAT (CONTINUED)		
P	Face frame stiles	3/4 x 2 x 17-1/2 in.
Q	Face frame rails	3/4 x 2 x 21-3/4 in.
R	Side filler strips	3/4 x 3-3/4 x 17-1/2 in.
S	Wall cleats	3/4 x 2 x 22-7/8 in.
36-IN.-WIDE OVER-DOOR CABINET		
T	Side panels	3/4 x 10 x 11-1/2 in.
U	Top and bottom panels	3/4 x 11-1/2 x 36 in.
V	Back panel	1/4 x 11 x 35-1/2 in.
W	Face frame stiles	3/4 x 2 x 12 in.
X	Face frame rails	3/4 x 2 x 32 in.
Y	Wall cleat	3/4 x 2 x 34-1/2 in.
TRIM		
Z	Baseboard	3/4 x 4-1/2 x cut to fit
AA	Base shoe	3/4 x 3/4 x cut to fit
BB	Top cap	3/4 x 2-1/2 x cut to fit

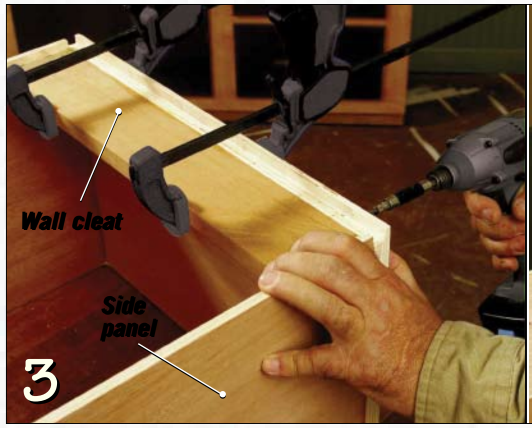
BUILDING A BOOKCASE



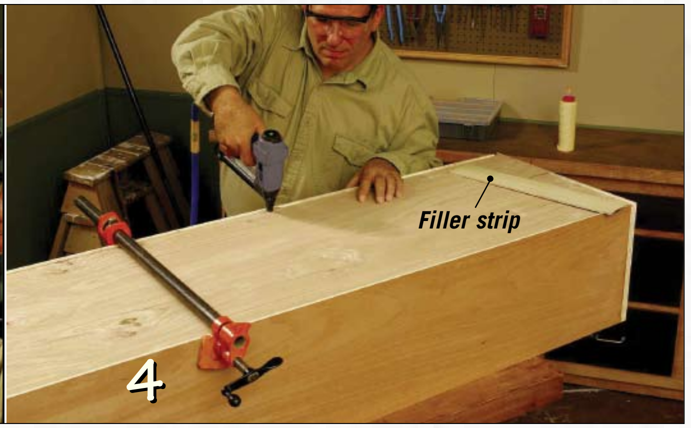
Rout a 1/2-in.-wide x 1/2-in.-deep rabbet in the back inside edge of the top, bottom and side panels. The depth of the rabbet is twice the thickness of the back panel.



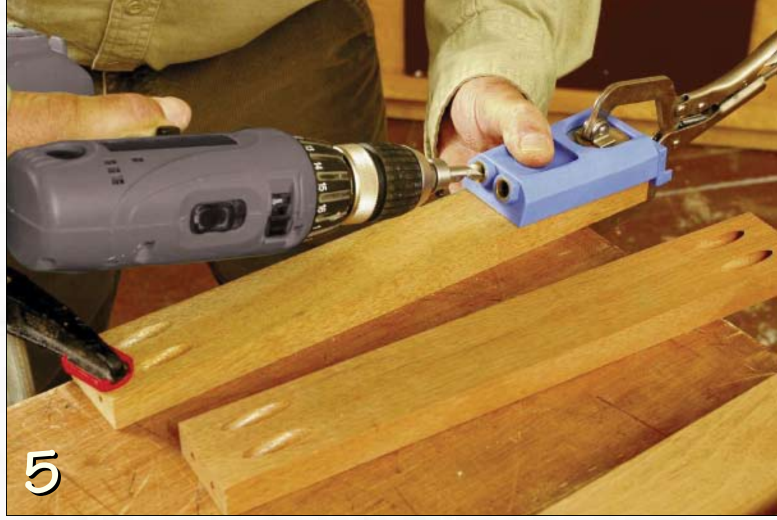
Use perforated hardboard as a jig for drilling the shelf-pin holes in the side panels. Space the holes 3 in. apart and 8 in. from the ends of the panels.



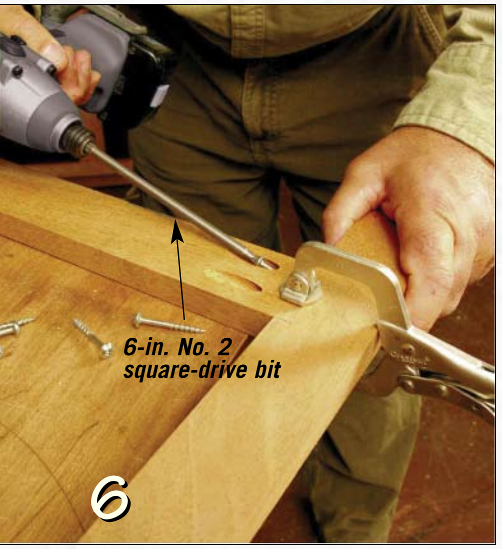
Assemble the top, bottom and side panels with glue and 2-in. coarse-thread screws. Then attach the wall cleat to the top and side panels with glue and 2-in. coarse-thread screws.



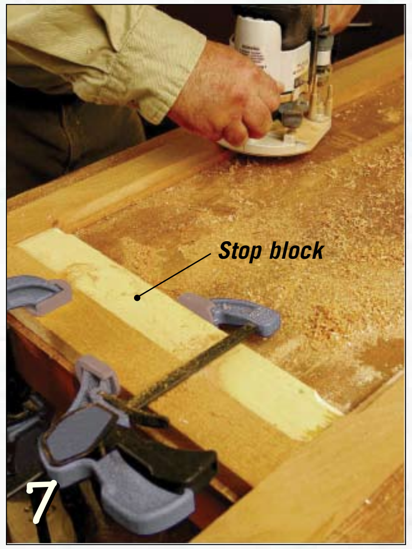
Attach the back panel to the cabinet with glue and 1-in.-crown staples. Then attach a 3-in.-wide strip of the back material to fill the gap left behind the wall cleat.



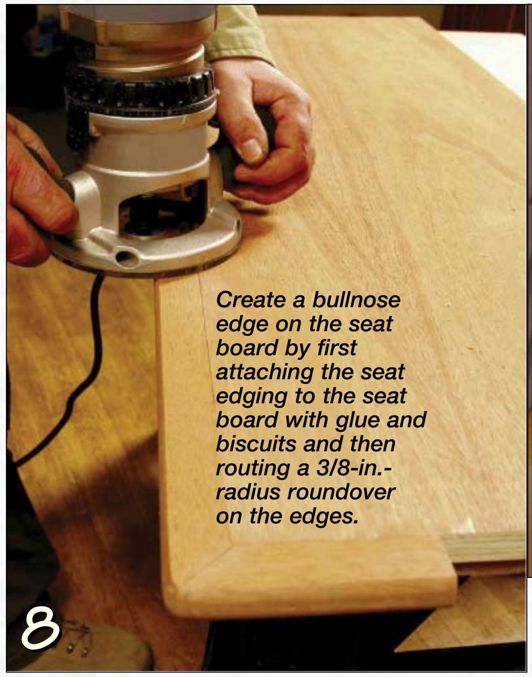
Use a stepped drill bit and pocket-hole jig to drill the pocket-screw holes in the rails.



Glue and clamp the face frame together, and secure the joints by driving self-tapping washer-head screws into the pocket holes.

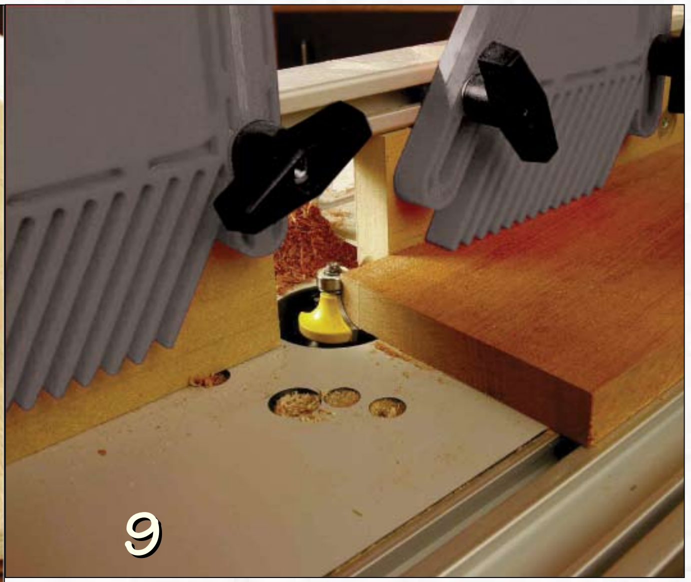


Rout the stopped cove profile in the face frame stiles with a bearing-piloted 1/4-in.-radius cove bit. Clamp a 2-in.-wide stop block to the rails to stop the cove cut at each end.

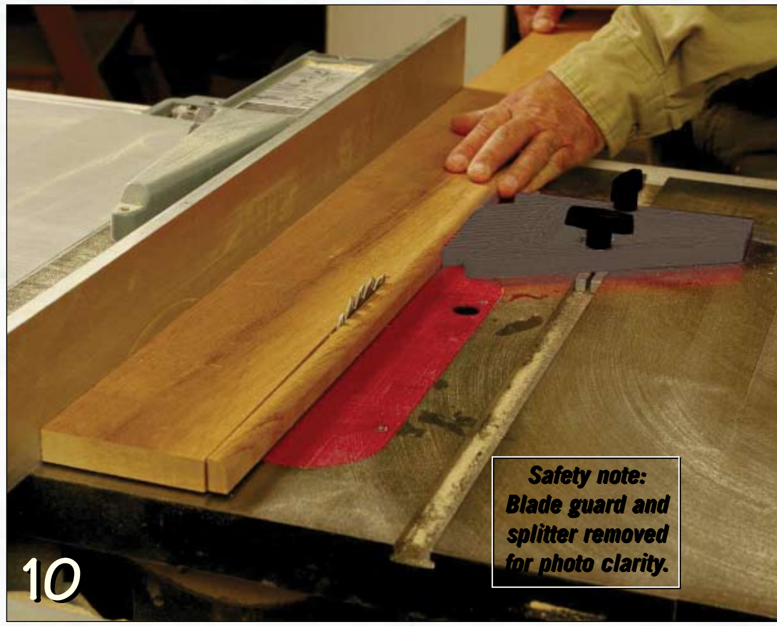


Create a bullnose edge on the seat board by first attaching the seat edging to the seat board with glue and biscuits and then routing a 3/8-in.-radius roundover on the edges.

MAKING MOLDINGS



To make the base shoe molding, first rout a 3/8-in.-radius roundover on a piece of trim stock lumber that is wider than the final base shoe width.



Next, rip the base shoe molding to its final 3/4-in.-width. Repeat the routing and ripping process to create multiple pieces of molding. You can use the same technique with any thin stock molding.

fit your space, but the construction will be the same.

The 2-in.-wide face will align with the cabinet side differently, depending on whether it covers an exposed end panel or the seam between two cabinets or it butts against an adjacent wall. The outside edge of the face frame should be flush with the outside face of an exposed end panel. The face frame should be centered on the seam between two cabinet side panels. And the face frame should overhang cabinet sides that butt against an adjacent wall by approximately 3/4 in. to allow for scribing. I designed our face frame in three sections to cover the large double cabinets on the left, the window seat and the single cabinet on the right side.

BUILD THE CABINETS

Sheet goods such as plywood and medium-density fiberboard (MDF) are perfect for building a large bookcase. A unit made with such large panels of solid wood would not only take longer to build and cost more but also be more vulnerable to future structural problems such as warping and splitting. For a natural-wood finish, use hardwood-veneer plywood for the cabinets and shelves and a matching solid wood for the face frames and shelf edging. If you plan to paint the bookcase, consider substituting MDF for the cabinets and shelves, and use poplar or pine for the face frames and shelf edging. (Either way, use solid wood for the face frames because of its appearance, workability and durability.)

We used 1/4-in. shelf pins (available at home centers and hardware stores) to support the shelves. Once you've routed the rabbet for the back (photo 1, above), bore the shelf-pin holes, using a piece of perforated hardboard as a template (photo 2). Drill the holes 1-1/2 in. from the front and back edges, 3 in. apart and beginning and ending 8 in. from the top and bottom.

The cabinet sides, top and bottom are joined with butt joints fastened with No. 8 x 2-in. wood screws (photo 3) and concealed by trim. Fasten the back, which covers the wall and squares up the cabinet, with glue and 1-in. crown staples or brads (photo 4). Then cut the shelves to size and attach a piece of solid-wood edging along the front edge of each shelf for reinforcement.

MILL THE TRIM

We used 2-in.-wide stock for the face frames, which are easy to assemble using pocket screws (photos 5 and 6). However, these fasteners require a drilling jig and stepped drill bit (see SOURCES ONLINE) to make an angled countersink hole for the pocket screw.

When milling the face frames, you can cut the profiles either after assembly or before you cut the stock to length. I cut the stopped cove profiles in the face frames after they were assembled, using a router with a bearing-piloted cove bit and stop blocks clamped at each end of the stile (photo 7). I worked in reverse order on the trim stock, cutting the profiles in the trim stock on a router table before cutting it to final width and length (photos 9 and 10). Cutting the profiles first allows for cleaner miter cuts and reduces tear-out.

APPLY THE FINISH

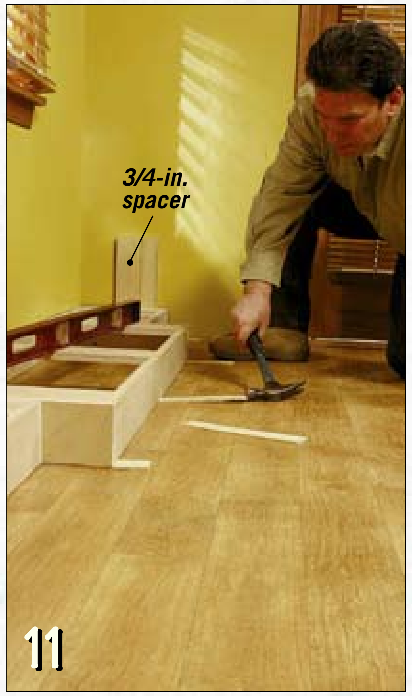
If you want a natural-wood look, apply the finish before installing the cabinets and trim — this keeps the mess out of the house. You can fill nail holes with matching wood putty after completing the installation.

If you choose to paint the bookcase, apply one coat of primer before installation. After you've completed the installation, you can caulk all of the seams, fill the nail holes with spackle and apply two coats of satin or semigloss interior paint.

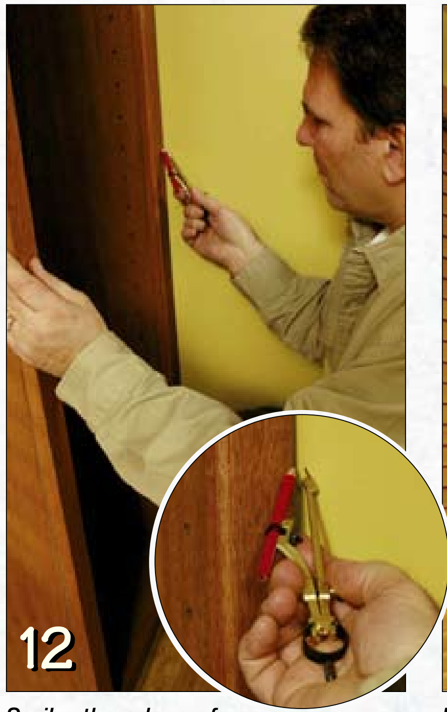
INSTALL THE CASE

A built-in bookcase should look like it is a part of the house and make flush connections with the surrounding surfaces. Achieving a clean and flush installation is not always easy because

INSTALLING A BOOKCASE



Position, level and fasten the plinth to the wall studs with 2-in. screws. Leave a 3/4-in. space between the plinth and any adjacent side wall.



Scribe the edges of the face frame to follow the wall profile using a compass. Trim to the line with a jigsaw or belt sander.

Fasten the face frame to the first cabinet with 2-in. finish nails. Secure the cabinet to the plinth with 1-1/4-in. screws and to the wall with 3-in. screws driven through the wall cleat.

most homes do not have flat, square walls. Compensating for irregularities is one of the biggest challenges of installing any built-in project.

The easiest way to overcome variations in floor height is by installing the bookcase on a level base called a plinth. Before securing the plinth, check that the walls are plumb, and position the plinth so that the back edge is in line with the part of the wall that extends farthest into the room (see “Positioning the Base,” below). Next, shim and level the plinth on the floor and screw it to the wall (photo 11).

Large dips or variations in the wall’s surface will be more apparent after the bookcase is installed. If variations in the surface are greater than 1/4 in., smooth them out with a skim coat of joint compound before installing the bookcase.

POSITIONING THE BASE

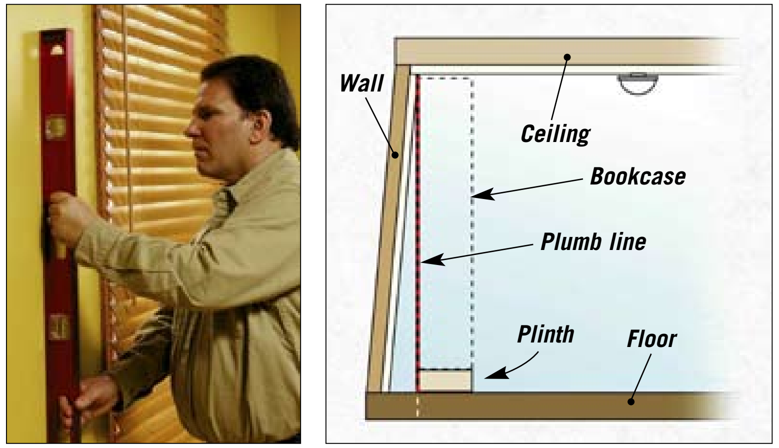
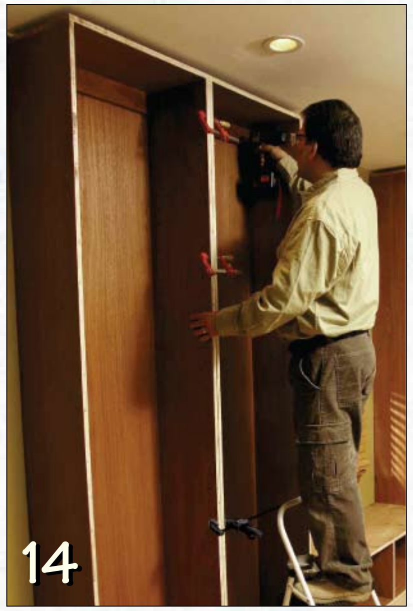


ILLUSTRATION BY MIKE ANDERSON

Use a 4-ft. level, laser level or plumb bob to check each wall for plumb (photo, above). Position and secure the base so that the back edge of the base is directly below the part of the wall that extends the farthest into the room (illustration, above right).

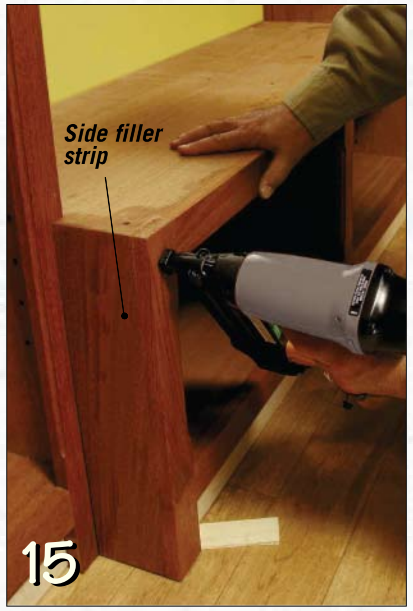
We used two methods to create a tight connection between the walls and ceiling. The first method, scribing, employs a compass or scribe to transfer the irregularities of the wall to the cabinet or face frame, which is then cut to match the profile of the wall. Our bookcase cabinets are designed with extra material to accommodate a small amount of scribing where the back meets the wall. The rabbet that holds the back panel is twice as deep as the back panel, leaving a 1/4-in.-wide x 1/4-in.-deep cabinet side extension beyond the back for scribing. If your walls will require more than 1/4 in. of scribing, you can cut a deeper rabbet for the back, but this may require you to make the shelves narrower to compensate for lost space inside the cabinet.

Position the cabinet and face frame so that it is plumb and touches the wall. Set the scribe or compass to match the widest gap between the wall and the face frame; then scribe the wall profile onto the face frame (photo 12 and inset). Trim the face frame on the scribe



14

Install the rest of the cabinets. Secure the cabinet sides to each other with 1-1/4-in. screws and to the wall by driving 3-in. screws through the wall cleat.



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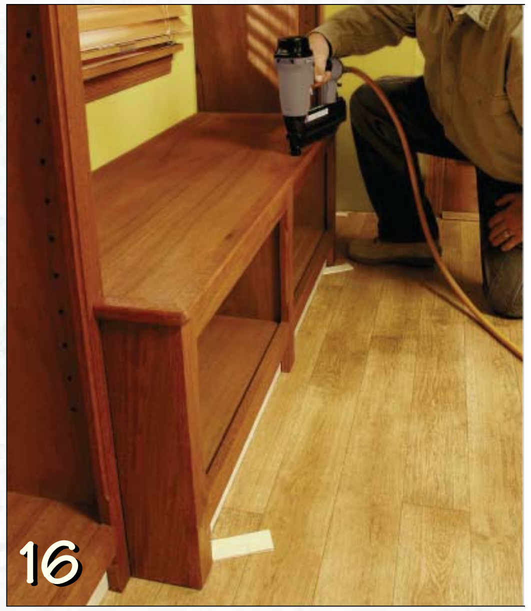
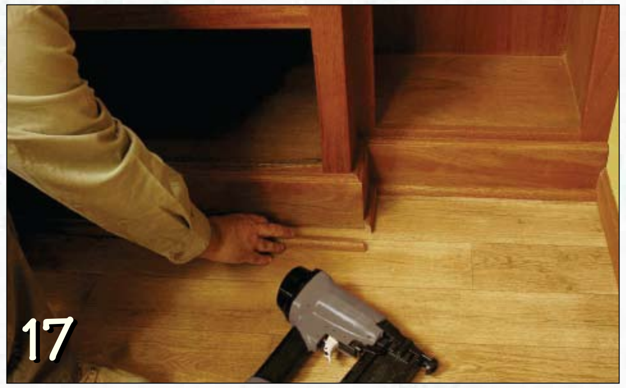
Solid filler strips conceal the sides of the window seat cabinet. The window seat face frame is fastened with 2-in. finish nails.



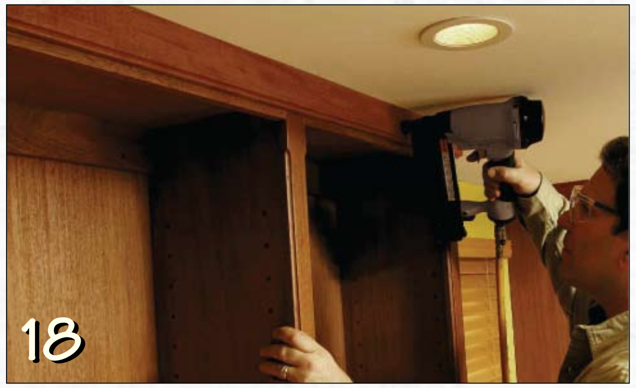
16

Attach the window seat board with 2-in. finish nails. To prevent nails from popping through the top of the window seat cabinet, be careful to drive them into the face frame and cabinet sides.



17

Miter the inside and outside corners of the base molding. Then position the base molding 1/4 in. below the top edge of the bottom face frame rail and attach it with 1-1/4-in. finish nails. Next, conceal any gaps between the base molding and the floor by attaching the base shoe.



18

Finish the installation by attaching the top cap molding to the face frame. If there are gaps larger than 1/4 in., scribe the top cap to match the ceiling. Otherwise, caulk any small gaps between the cabinet and walls or ceiling, and touch up with matching paint.

line. When you attach the face frame to the cabinet, it will fit tightly against the wall, covering any gaps.

The second way to compensate for gaps is to cover them with trim pieces. This technique is easy, but it works best with flexible pieces of trim. For example, we used base shoe to conceal the gaps between the baseboard and floor.

The bookcase must be securely fastened to the wall. In order to ensure a flush fit against the side wall, I secured the scribed face frame to the first cabinet before securing it to the plinth and wall (photo 13). I then fastened the first cabinet in place by driving 1-1/4-in. screws through the bottom into the plinth and by driving 3-in. screws through the wall cleat at the stud locations. Secure the remaining bookcase cabinets to each other with 1-1/4-in. screws and then fasten them to the plinth and wall (photo 14). Finally, attach the remaining face frame and trim to the cabinets with 2-in. and 1-1/4-in. finish nails (photos 15 to 18). Fill the nail holes with putty to match the wood finish, or apply spackle and then paint.

Allow the finish to cure before installing the shelf pegs and shelves. When deciding what to put on each shelf, place the largest and heaviest items on the lower shelves, and work your way up with smaller or lighter-weight objects. This technique makes the bookcase more stable and enhances its visual appeal. ◆

SOURCES ONLINE

For online information, go to www.HandymanClub.com and click on SOURCES ONLINE.

Jeld-Wen Windows and Doors, 800-535-3936

Kreg Tool Co. (pocket-hole jig and self-tapping screws), 800-447-8638

Levolor (window and door blinds) 800-538-6567

Simpson Door Co., 800-952-4057